

CLAIMS

1. A method for distributing content to a plurality of receivers, wherein said content is packetized into one or more packets, comprising:
 - establishing a multicast distribution tree rooted at a sender; and
 - directing the transmission of one or more packets along at least a portion of the multicast distribution tree,

wherein the at least a portion of the multicast distribution tree along which the one or more packets travel is varied on a packet-by-packet basis.
2. The method of claim 1, wherein the step of directing the transmission further comprises:
 - encoding each of the one or more packets with at least a portion of said multicast distribution tree, wherein the multicast distribution tree identifies the receiver to which each packet is to be delivered and the path along which each packet is to travel to the receiver.
3. The method of claim 2, wherein the multicast distribution tree is sender-defined.
4. The method of claim 1, wherein the step of directing the transmission comprises:
 - sending one of said one or more packets to a first group of receivers;
 - creating at least one copy of the packet by at least one of said first group of receivers; and

forwarding at least one copy of the packet to at least one receiver in a subsequent level within said multicast distribution tree.
5. The method of claim 1, wherein each receiver that is not a final destination for said one or more packets copies and forwards said one or more received packets to a subsequent receiver in accordance with said at least a portion of the multicast distribution tree.

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6. The method of claim 2, further comprising:
encoding at least some of the one or more packets with forward error correction coding.
7. The method of claim 4, wherein transmissions from sender-to-receiver and receiver-to-receiver are individually accomplished using unicast distribution communication.
8. The method of claim 1, wherein the step of establishing a multicast distribution tree comprises:
adjusting a structure of the multicast distribution tree to address a given metric, wherein said metric is at least one of cost, delay, bandwidth, latency or reliability.
9. A method for distributing content to a plurality of receivers, wherein said content is packetized into at least one packet, comprising:
establishing a multicast distribution tree rooted at a sender; and
directing the transmission of the at least one packet along at least a portion of the multicast distribution tree,
wherein the receivers to which the at least one packet is sent, and the paths along which the at least one packet is sent to the receivers, are defined by the sender.
10. The method of claim 9, wherein the at least a portion of the multicast distribution tree along which the one or more packets travel is varied on a packet-by-packet basis.
11. The method of claim 9, wherein the step of directing the transmission further comprises:
encoding the at least one packet with at least a portion of said multicast distribution tree, wherein the multicast distribution tree identifies the receivers to which

the at least one packet is to be delivered and the paths along which the at least one packet is to travel to the receivers.

12. The method of claim 9, wherein the step of directing the transmission comprises: sending the at least one packet to a first group of receivers; creating at least one copy of the at least one packet by at least one of said first group of receivers; and

forwarding the at least one copy of the at least one packet to at least one receiver in a subsequent level within said multicast distribution tree.

13. The method of claim 9, wherein each receiver that is not a final destination for the at least one data packet copies and forwards the at least one received packet to a subsequent receiver in accordance with said at least a portion of the multicast distribution tree.

14. The method of claim 11, further comprising:
encoding the at least one packet with forward error correction coding.

15. The method of claim 12 wherein transmissions from sender-to-receiver and receiver-to-receiver are individually accomplished using unicast distribution communication.

16. The method of claim 9, wherein the step of establishing a multicast distribution tree comprises:

adjusting a structure of the multicast distribution tree to address a given metric, , wherein said metric is at least one of cost, delay, bandwidth, latency or reliability.

17. A system for distributing content to a computer network comprising:
 - a server adapted for sending at least one data packet, where said at least one data packet contains at least a portion of a multicast distribution tree.
 - wherein both the server and the first group of receivers each comprise a packet forwarding mechanism.
18. The system of claim 17, wherein the server is adapted to define a distribution tree for distributing the at least one data packet to the at least a first group of receivers.
19. The system of claim 17, wherein the distribution tree defines receivers to which the at least one data packet is directed and the paths along which the at least one data packet travels to the receivers.
20. The system of claim 17, wherein the system is adapted to distribute content on a packet-by-packet basis.
21. The system of claim 17, wherein each receiver that is not a final destination for the at least one data packet is adapted to copy the at least one data packet and forward the at least one data packet on to a subsequent receiver.
22. The system of claim 17, wherein the server is adapted to encode the at least one data packet with forward error correction coding.
23. A computer readable medium containing an executable program for distributing content to a plurality of receivers, wherein said content is packetized into one or more packets, where the program performs the steps of:
 - establishing a multicast distribution tree rooted at a sender; and
 - directing the transmission of one or more packets along at least a portion of the multicast distribution tree,

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wherein the at least a portion of the multicast distribution tree along which the one or more packets travel is varied on a packet-by-packet basis.

24. The computer readable medium of claim 23, wherein the step of directing the transmission further comprises:

encoding each of the one or more packets with at least a portion of said multicast distribution tree, wherein the multicast distribution tree identifies the receiver to which each packet is to be delivered and the path along which each packet is to travel to the receiver.

25. The computer readable medium of claim 23, wherein the multicast distribution tree is sender-defined.

26. The computer readable medium of claim 23, wherein the step of directing the transmission comprises:

sending one of said one or more packets to a first group of receivers;
creating at least one copy of the packet by at least one of said first group of receivers; and
forwarding at least one copy of the packet to at least one receiver in a subsequent level within said multicast distribution tree.

27. The computer readable medium of claim 23, wherein each receiver that is not a final destination for said one or more packets copies and forwards said one or more received packets to a subsequent receiver in accordance with said at least a portion of the multicast distribution tree.

28. The computer readable medium of claim 24, further comprising:

encoding at least some of the one or more packets with forward error correction coding.

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29. The computer readable medium of claim 26, wherein transmissions from sender-to-receiver and receiver-to-receiver are individually accomplished using unicast distribution communication.

30. The computer readable medium of claim 23, wherein the step of establishing a multicast distribution tree comprises:

adjusting a structure of the multicast distribution tree to address a given metric.

31. The computer readable medium of claim 23, wherein the step of establishing a multicast distribution tree comprises:

adjusting a structure of the multicast distribution tree to address a given metric, wherein said metric is at least one of cost, delay, bandwidth, latency or reliability.

32. A computer readable medium containing an executable program for distributing content to a plurality of receivers, wherein said content is packetized into one or more packets, where the program performs the steps of:

establishing a multicast distribution tree rooted at a sender; and

directing the transmission of the at least one packet along at least a portion of the multicast distribution tree,

wherein the receivers to which the at least one packet is sent, and the paths along which the at least one packet is sent to the receivers, are defined by the sender.

33. The computer readable medium of claim 32, wherein the step of directing the transmission further comprises:

encoding the at least one packet with at least a portion of said multicast distribution tree, wherein the multicast distribution tree identifies the receivers to which the at least one packet is to be delivered and the paths along which the at least one packet is to travel to the receivers.

34. The computer readable medium of claim 32, wherein the step of directing the transmission comprises:

 sending the at least one packet to a first group of receivers;

 creating at least one copy of the at least one packet by at least one of said first group of receivers; and

 forwarding the at least one copy of the at least one packet to at least one receiver in a subsequent level within said multicast distribution tree.

35. The computer readable medium of claim 32, wherein each receiver that is not a final destination for the at least one data packet copies and forwards the at least one received packet to a subsequent receiver in accordance with said at least a portion of the multicast distribution tree.

36. The computer readable medium of claim 33, further comprising:

 encoding the at least one packet with forward error correction coding.

37. The computer readable medium of claim 34 wherein transmissions from sender-to-receiver and receiver-to-receiver are individually accomplished using unicast distribution communication.

38. The computer readable medium of claim 32, wherein the step of establishing a multicast distribution tree comprises:

 adjusting a structure of the multicast distribution tree to address a given metric, wherein said metric is at least one of cost, delay, bandwidth, latency or reliability.